

Southeast Asia: Renewable Energy Investment Strategies

An Honors Thesis (HONRS 499)

By

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A handwritten signature in black ink, reading "Gwendolen B. White". The signature is fluid and cursive, with the first name being the most prominent.

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Abstract

Because of the growing population and dispersion of wealth in Southeast Asia, the demand for energy is increasing, as well as a dependency on oil and coal imports. Southeast Asia consists of ten countries: Brunei Darussalam, Laos, Vietnam, the Philippines, Cambodia, Burma, Indonesia, Malaysia, Singapore, and Thailand. This paper proposes solutions to decrease the dependency on energy imports in Southeast Asia through renewable energy development. In general, the energy market is extremely competitive. Renewable energy sources, such as solar, wind, tides, and biofuels, are still developing and currently more expensive than fossil fuels, creating a competitive disadvantage for renewable energy producers. In Southeast Asia, potential projects face not only competition, but also a lack of universal electric grid infrastructure, no comprehensive transmission system, and in some countries, no extensively developed transportation system.

A significant capital investment is required to establish, complete, and maintain renewable energy projects. This paper focuses on developing strategies to promote both foreign and domestic investments with the goal of creating an environment suitable for renewable energy market growth in Southeast Asia. The strategies will be developed through analyzing government structure and policy, current economic and energy market conditions, renewable energy resource potential, and market barriers in the Philippines, Cambodia, and Vietnam. These three countries have a population growth greater than the global average and a variety of infrastructure development levels, making strategies applicable to a wide range of countries and encouraging a positive economic impact across the entire region of Southeast Asia. Only through evaluating each of these aspects will effective strategies be developed and implemented for the creation of a better investor environment and economic growth for the entirety of Southeast Asia.

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Introduction

Because of the growing population and dispersion of wealth in Southeast Asia, the demand for energy is increasing, as well as a dependency on oil and coal imports. Southeast Asia consists of ten countries: Brunei Darussalam, Laos, Vietnam, the Philippines, Cambodia, Burma, Indonesia, Malaysia, Singapore, and Thailand. About 90% of the Southeast Asian countries primary energy demand is fulfilled by fossil fuels. Southeast Asia has control over about 8% of the world's fossil fuels, but the region still imports about 60% of its demand from the Middle East (Thavasi & Ramakrishna, 2009). Energy demand in the region is expected to double by 2030 due to an increasing population, rapid pace of industrialization and urbanization, and growing export-oriented technologies. The level of energy demand is directly related to gross domestic product (GDP) per capita. As the country's prosperity increases, so does its emissions per capita.

This paper proposes solutions to decrease the dependency on energy imports in Southeast Asia through renewable energy development. In general, the energy market is extremely competitive. Renewable energy sources, such as solar, wind, tides, and biofuels, are still developing and currently more expensive than fossil fuels, creating a competitive disadvantage for renewable energy producers. In Southeast Asia, potential renewable energy projects face not only competition, but also a lack of universal electric grid infrastructure, no comprehensive transmission system, and in some countries, inadequate transportation systems, all of which are necessary for an integrated, efficient energy market.

A significant capital investment is required to establish, complete, and maintain renewable energy (RE) projects in Southeast Asia. These investments can only be successful in a strong, established energy market. In a strong market, competition and oversight are prevalent,

creating a steady environment. If the market is volatile and risky, then the required rate of return on investment will be too high to allow for more capital expenditures, which in turn inhibits RE technology and project developments (Posadas, Philippines risks missing out on clean energy boom, 2009).

This paper focuses on developing strategies to promote both foreign and domestic investments with the goal of creating an environment suitable for RE market growth. The strategies will be developed through analyzing government structure and policy, current economic and energy market conditions, renewable energy resource potential, and market barriers in the Philippines, Cambodia, and Vietnam. These three countries have a population growth greater than the global average and a variety of infrastructure development levels. The Philippines has a more competitive market and established legislative efforts to entice RE investments. Cambodia has significant government and structural issues, and Vietnam has a socialist culture. These conditions make strategies applicable to a wide range of countries and encourage a positive economic impact across the entire region of Southeast Asia.

Overview of Market Barriers and Strategies in Southeast Asia

According to Kumar and Bhattacharya (2005), there are four main barriers for RE projects in Southeast Asia:

1. High cost of system due to unavailability of system components locally
2. Inadequate capital and resources to develop RE technology locally
3. Lack of awareness of RE among policy makers, entrepreneurs, and users
4. Lack of lessons from a practical experience of RE installation that can be useful for the investor to project developers (Kumar & Bhattacharya, 2003)

To lessen the high cost of systems, governments can provide subsidies to users to reduce the initial capital cost of the RE systems (Nguyen, 2007). Government can promote RE by taxing CO₂ emissions, which is called carbon taxation (Nguyen, 2007). The added tax will encourage businesses to increase efficiency and cut costs through RE innovation, while also encouraging RE technology investment. Some case studies have shown that small companies and projects may help improve the adoption rate and reduce capital costs (Das & Ahlgren, 2010).

Inadequate capital and a small market creates a deficiency in RE technologies because of the lack of infrastructure and established processes (Das & Ahlgren, 2010), but these drawbacks can be countered by a decentralized system. Rural areas are already more viable for solar and wind systems than grid electricity, and decentralization of RE technology is cost-competitive with grid extension, especially for areas with low load density and fewer households that require electricity. The demand is located closer to the source, which keeps transmission distribution costs down, as well as decreases energy and capacity loss. Decentralization using RE technology also lowers the demand of fossil fuels to create energy and creates more employment locally because of installation and operation occurs in the rural areas (Nguyen, 2007).

Some countries in Southeast Asia lack strong education systems to promote quality human resources. Because of this, they lack knowledge and awareness of RE technologies. Governments and organizations can disseminate information through potential users, policy makers, entrepreneurs, businesspersons, and funding agencies by distributing educational materials, books, training manuals, or books and offering workshops, seminars, or courses. A case in Africa highlights these awareness methods. The GEF solar project in Zimbabwe used attending agricultural and trade fairs, mass media, and leaflet distribution to spread awareness.

Project participants also completed system demonstrations to show technical and financial viability of the project (Das & Ahlgren, 2010).

One way to combat a lack of practical experience is to promote technology transfer projects. By creating partnerships and joint ventures with companies or organizations that are more advanced, education and awareness are spread, as well as both domestic and international investment. RE projects demand high attention after completion, so local labor is needed to sustain operations. By sharing technology and resources, both companies in a joint venture benefit by creating jobs in the area and allowing for onsite, local maintenance on equipment (Das & Ahlgren, 2010). Also, any breakthrough in scientific findings contributes to RE technology and supports the country's economy (Thavasi & Ramakrishna, 2009).

The additional barrier in Southeast Asian countries that Kumar and Bhattacharya (2005) do not mention is corruption. Corruption has become engrained in the region through years of practice. To develop an efficient environment for investment, trust and transparency are necessary. If investors cannot trust information or processes, then the market will be hindered. The first step in reducing corruption is identifying and proscribing corrupt practices in government and business practices. The second step is to strengthen monitoring, investigation, and enforcement of the identified practices. This can be done by better legislation or training in enforcement agencies and organizations. The third step is to reduce opportunities to engage in corrupt practices by increasing transparency in organizations, as well as avoiding conflicts of interest. The final step is campaigning for the ethical responsibilities among both government officials and the public through expressed ethical codes and education for all citizens (Jones, 2009).

According to Thavasi and Ramakrishna (2009), there are five strategies to strengthen economic competition, enhance energy security, and improve environmental sustainability and the investor environment:

1. Promote competitive markets
2. Improve energy efficiency
3. Diversify energy supplies
4. Investment in RE development plan
5. Regional and international cooperation (Thavasi & Ramakrishna, 2009)

Governments have the ability to promote market liberalization and privatization, which means creating an open market. These actions are proven to help developing countries by increasing competition and allowing the market to drive structural improvements. Competitive markets also influence innovation by promoting cost effective methods and efficiency (Thavasi & Ramakrishna, 2009).

Energy efficiency is a struggle for all countries and regions. It includes improvements to energy conversion, transmission, and distribution systems with the goal of increasing market competition (Thavasi & Ramakrishna, 2009). Batteries can be used to store energy, but no longer-term technology has been developed to meet this demand. Efficiency can be developed through technology innovation, as well as conservation and awareness. Government programs and individual organizations can lead these innovations through incentive programs and research, which will promote capital investments in the region.

A universal grid system has a common technology base for connecting energy sources to the electricity transmission structure and diversifies energy supplies. This type of system in Southeast Asia will allow a variety of technologies to be distributed across the region more

easily. The interconnection would be challenging due to the large amount of capital necessary, politics, technical issues, and a lack of a common tax structure. However, the system has the benefit of accessibility to importing and exporting energy, as well as the diversified market (Thavasi & Ramakrishna, 2009). With a more connected region, companies will have greater access to both imported and exported energy, creating an opportunity for domestic and international business growth. Organizations that invest in the area will have a larger potential consumer base, making the region more appealing to investment.

Government is one of the most important factors in creating a better investor environment. Governments should develop a target, as well as a timeline, for increased use of RE technology (Nguyen, 2007). There should be targets at different stages, so that continuous progress can be easily recognized (Das & Ahlgren, 2010). Strong government support is necessary for RE technology to flourish in a country, and governments must have effective oversight mechanisms, such as public financial management. Only when there is a well-functioning system can elected-officials and government institutions be held accountable for their actions, allowing a safe investment environment to develop (Un & So, 2009).

Advanced technologies can be promoted through export credits, which benefit both the donor and recipient, but there must be favorable market conditions for credit worthiness (Das & Ahlgren, 2010). Commonly, feed-in tariffs, or additional charges to energy consumers covering the costs of RE sources, are widely used throughout the European Union (EU) to encourage RE technology. Tax credits are also used in the EU and the United States. The drawback to using tax credits in Southeast Asia is there are fewer RE companies in the region to trade, so the demand for these credits has not developed yet (Posadas, Philippines risks missing out on clean energy boom, 2009).

By evaluating these barriers and strategies, solutions to help develop an investor environment in the Philippines, Cambodia, and Vietnam can be determined. These countries are at different stages in economic and energy market development, as well as have different government policies and market barriers. They can serve as examples for a range of countries within Southeast Asia.

The Philippines

The government, energy market, and current economic situation affect the investor environment in the Philippines. In 2006, the Philippines had a population of 86.2 million people, and the population is expected to continue to grow at an average rate of 1.5% through 2030 (Asian Development Bank, 2009). The Philippines operates as a republic with the president as both the head of state and head of the government. There is a bicameral legislature called the Congress. There is also an independent judiciary headed by a supreme court (The Philippines, 2011). The government tends to be highly liberalized around economic policies and sees foreign investors as great assets to the country's growth (Thavasi & Ramakrishna, 2009).

Private consumption is the leading contributor to the economy, accounting for around 74% of the total. Even after the global recession in 2008 and 2009, the Philippines is expected to have GDP growth in 2011. Currently, interest rates are low because of the global recession. The government has decreased reserve requirements for banks, as well as allowed banks to rediscount more securities (The Economist Intelligence Unit Limited, 2010). The government is encouraging capital borrowing through making loans less expensive for banks. The prospect for GDP growth and low cost of capital encourages investment in the region due to the relatively stable economic situation.

About 81% of households have electricity in the Philippines (Asian Development Bank, 2009). The country's energy demand is expected to grow an average of 3.9% per year from 2000 to 2030, and the country's electricity demand is expected have an annual growth rate of 5.9%. This growth creates a demand for more efficient energy sources, as well as increasing the amount of energy produced within the country. The transportation sector dominates the energy consumption with 40% of the market, which is atypical compared to other countries in the region. Businesses and the general population are more dependent on road transportation because there is no highly developed rail network in the country. The amount of transportation consumption is expected to triple from 2000 to 2030. The second largest energy demand is from households. This segment of the market is anticipated to lose some of its share by 2030 to other sectors, including the transportation and commercial sectors (Das & Ahlgren, 2010). This growing demand creates opportunities to develop more efficient power resources, as well as demand for RE sources. The return potential on RE projects grows with energy demand.

The primary energy sources in the Philippines are coal, oil, and renewable, and these should remain prevalent in the coming years (Das & Ahlgren, 2010). The country has historically lacked abundant fossil energy resources, making it a net energy importer, but indigenous energy production is growing due to RE, natural gas, and coal resources. The Philippines alone is the second-largest geothermal power producer in the world behind the United States (Asian Development Bank, 2009). However, oil still dominates the market with a share of 50%, and coal power generation is expected to average growth of 9% each year from 2000 to 2030. RE sources generated about 49% of energy in 2002, but its market share will drop to 22% by 2030 if the trend continues (Das & Ahlgren, 2010). With an already substantial RE

market share, some of the infrastructure required for more RE projects will already be in place, allowing for easier investments.

Energy independence is a high priority of the Philippine government. If the growth rates continue, the country will deplete its resource, increasing dependence on foreign imports and decreasing the country's global competitiveness. Because of these trends, new government policy is directed towards energy self-sufficiency and an efficient and globally competitive energy sector. The 2007 Philippines Energy Plan highlights methods to reduce import dependency to 40% by 2010 and to sustain that level. The legislation also outlined actions to “accelerate the exploration, development, and utilization of indigenous energy course; intensify renewable energy resource development; increase the use of alternative fuels; and enhance energy efficiency and conservation” (Asian Development Bank, 2009). In 2008, Congress passed the Philippines Renewable Energy Act. This act gives companies and entities that engage in RE incentives, such as income tax holidays for the first seven years of operation and exemption from import duties on many types of RE equipment. The country also allows renewable power producers to charge a premium over fossil fuel sources, which is called a feed-in tariff (Posadas, Asia can help lead climate-change fight, 2009). In addition, the Philippines has legislation with a Green Option that allows consumers to opt for some clean-energy-generated power in their bill. However, this option will only be beneficial if consumers are willing to pay more for RE sources (Posadas, Philippines risks missing out on clean energy boom, 2009).

These efforts from the government to increase incentives for new projects and investments have helped the investor environment, but further steps can be taken to attract development. First, the government could encourage research on RE potential in the area

through grants and funding. These grants and funding could be provided to colleges, universities, researchers, and scholars, which would allow for awareness and innovation in RE to spread. These innovations entice new projects and investors through an increased efficiency in the area and local development and knowledge.

Second, the Philippines is undergoing infrastructure improvements, especially in its transportation systems. One way to help find funding for these projects is collaborating with corporations and businesses. Participation is encouraged through providing discounts or incentives, such as tax credits or discounts, to supportive organizations. These infrastructure developments will help the participating organizations in the long run, but incentives for the short run are necessary to get their support. However, the Philippines has a significant challenge of corruption throughout the government and government procurement processes. In 2005, the World Economic Forum ranked the Philippines 112 out of 125 countries based on the frequency of bribery in public contracts. Then, in 2008, the country received a score of 2.3 out of 10 in the Transparency International Corruption Perception Index. Elite families in the business community often use bribery to ensure public procurement contracts go to their businesses. Most of the time, corruption is possible because of entrenched cronyism and nepotism (Jones, 2009). Trust is necessary in an open market; otherwise, efficiency will be lost. The country can combat corruption through acknowledging the problem and using its legislative and executive powers to develop monitory processes.

Third, partnerships and joint ventures would also help develop a better environment for investors. With partnerships and joint ventures, the risk of capital investment decreases because it becomes a shared risk. The government has already decreased the cost of capital by lowering interest rates and borrowing rates, but establishing programs with both domestic and

international organizations will help push RE innovation investments. Some incentives that could be used are tax credits or discounts for a designated amount of time after production and operation begins.

Cambodia

In 2006, Cambodia had a population around 14.2 million people, and the population will continue growing at an annual rate of 1.6% from 2005 to 2030. The GDP is around \$6.3 million and is expected to grow at an average annual rate of 6.8% from 2005 to 2030. The GDP is mainly driven by the services sector, but as the country develops its electricity infrastructure, the share of the industry sector to GDP will grow significantly (Asian Development Bank, 2009). With both a growing population and GDP, investment opportunities throughout the entire economy are created.

Cambodia has a constitutional monarchy and a bicameral parliament. The parliament consists of the National Assembly and the Senate. The king, who is head of state, is chosen by the Royal Council of the Throne from among the royal family. The government is led by the premier or prime minister, who is chosen by the head of the National Assembly and appointed by the king (Cambodia, 2011). The weak social and political institutions allow the elite members of society to exploit the country's natural resources for political gains (Un & So, 2009). The Cambodian people are generally passive but do focus on major political issues. Since 1984, Hun Sen has served as the sole prime minister. He is openly hostile to foreign interference and advice, which creates complications for international investment (Cock, 2010).

The government is built around a patrimonial system, which means a leader's power comes from his ability to capture and maintain the loyalty of important political and social figures. So, the executive branch has the majority of power. The political environment is

devised in a way that interlocking patron-client networks commonly result in the misallocation of government resources, corruption, and unresponsive government institutions (Jones, 2009). The extremely inefficient workings of the government do not create an open, competitive economic market. This hinders the development of a safe, stable investor environment.

Under the current system, the National Assembly is constitutionally empowered; however, it lacks political will, capital, and human resources to exercise its legislative and oversight powers effectively. The judicial system is also weak and politically dependent. It lacks human and capital resources and has low intrainstitutional cooperation with significant corruption. In addition, the budget and financial management systems are of poor quality. The government has acknowledged these issues and has tried to apply reforms to its systems, but the results have been mixed. For example, in 1999, the government implemented a new tax collection policy. The result was an increase in tax collected to GDP ratio from 8.3% to 12%, but the collection rate remains the lowest in the world due to the leakage of funds. Without a sound legislative branch, judicial system, or budget and financial management systems, the country cannot develop a level playing field in the political, economic, and socio-cultural realms, creating difficulties in promoting both domestic and international investment (Un & So, 2009).

Only about 20% of all households in Cambodia use grid electricity, which originates from a poor electricity infrastructure. The country's electricity supply is fragmented into small power systems based around provincial towns and cities. Because of this fragmentation, the maintenance processes are inconsistent and resources are not allocated effectively, causing the electricity prices in Cambodia to be the highest in Southeast Asia. These high costs discourage new industrial projects and investments (Asian Development Bank, 2009).

From 2005 to 2030, the final energy demand is projected to grow by 3.9% per year, and final energy demand for the industry sector is anticipated to increase by 15.0% per year. The increase can be explained by expanding industrial activities and the development of an energy supply infrastructure (Asian Development Bank, 2009). As industries and infrastructure expand, the standard of living increases, causing the demand for power and electricity to grow as well. This growth creates RE investment opportunities to meet the evolving demand.

The Cambodian government is pushing to develop indigenous energy sources to satisfy electricity demand. In 2005, Cambodia's power generation mix consisted of 95% oil-based electricity and the other 5% in hydropower. Because of the high dependence on oil product, the country's competitiveness in the open market is smaller in comparison to other countries in the region. Cambodia is rich in hydropower resources, and hydropower is the preferred source of electricity to diversify Cambodia's energy supply. However, hydropower has high capital requirements and is limited during periods of drought, which can deter investors (Asian Development Bank, 2009).

The country is taking additional steps to address its changing energy demand. Currently, Cambodia has one of the highest per capita biomass consumption rates in the world. Biomass resources, such as wood, trees, and dung, are limited, and if they are not monitored, there could be serious implications for the local forests. Some measures being considered are the utilization of fossil fuels and the development of more efficient cook stoves, especially in rural areas. The Cambodian government also realizes that improving efficiency energy-consuming devices is necessary, but with the capital constraints, the government will find making adaptations or implementations of RE projects without foreign aid and support is difficult (Asian Development Bank, 2009).

Cambodian government policy in creating an efficient RE market is not as developed as the policy in the Philippines. Cambodia also faces an underdeveloped government in comparison to other countries in the region. This underdevelopment creates difficulties in implementation and enforcement of any new legislation. Therefore, a more stable and established government is necessary before any other steps can be taken toward attracting RE investments. Cambodia has a history of ineffective and destructive foreign involvement, but the country's best option for developing a better government is using foreign examples and aid in developing their internal processes and policies.

Bribery, cronyism, and nepotism are prevalent throughout Cambodian government officials and government procurement, especially in significant infrastructure projects. These infrastructure projects are necessary for RE technology development, so corruption is directly affecting the investor environment. In 2006, it is estimated that fees and commissions paid to government officers was around \$300 million, which is equivalent to 50% of total government revenues. In 2008, the Transparency International ranked Cambodia 166 out of 180 in the Transparency International Corruption Perception Index. Even though Cambodia has undergone international pressure for its entrenched corruption, the Cambodian legislature has failed to pass an anticorruption law that has been stalled in draft form since it was written in 1994 (Un & So, 2009). To move forward and to gain substantial investments and business partnerships, the corruption and overpowering government inefficiencies must be overcome.

Once a more secure and trustworthy government is established, then Cambodia can start using the government's legislative power to launch RE goals and incentives. Currently, there are no tax and capital incentives to invest in RE. Because high government officials are reluctant to allow international investment, incentives for domestic organizations should be implemented

first. Some examples of incentives that can be used are feed-in tariffs, tax breaks, and discounted loans. As domestic businesses grow, then partnerships and joint ventures with foreign companies will become appealing, creating more opportunity for innovation and efficiency.

The country will also want to focus on rural projects using a decentralized system. By encouraging a system of small, focused energy sources, more people will be able to access and use the electricity, as well as afford it. These small projects will appeal to investors through the lower maintenance costs and smaller capital requirements due to a more localized structure. The maintenance can be performed by local inhabitants, reducing the need for a large connected maintenance system. Because the system will be more efficient for the rural culture of the country, more people will be able to afford electricity, creating a larger customer base for energy companies.

Vietnam

Vietnam has a population around 82 million, with about 70% living in rural areas (Nguyen, 2007). The GDP is anticipated to grow by 6.2% annually over the 2005 to 2030 outlook period, while the population grows by 1.1% annually over the same period (Asian Development Bank, 2009). The country operates as a socialist republic with a dominating communist party. The country has a president, who is the head of state, and a prime minister. The legislative branch is the National Assembly, which consists of members elected by popular vote (Vietnam, 2011). The government is highly involved in all markets and individual businesses, which affects business efficiencies and investor opportunities.

Vietnam produces large amounts of coal from deposits in the northern part of the country. It also has offshore oil and gas deposits in its southern waters, making crude oil an important

export. Since the Vietnam War, the manufacturing industry has had strong growth, and the government has become more open to foreign investment (Vietnam, 2011). Even though politics has a strong role in business, the new openness of the government has allowed for greater innovation and investment.

Like the Philippines and Cambodia, corruption, especially bribery and collusion, is entrenched in Vietnamese public contracting. Cronyism is prevalent, and there is a history of embezzlement by party members and government officials. In 2005, the World Economic Forum ranked Vietnam 106 out of 125 countries in frequency of bribery in government contracts. Also in 2008, Vietnam received a score of 2.7 out of 10 on the Transparency International Corruption Perception Index (Jones, 2009). With corruption so incorporated into everyday processes, the international investing environment suffers. In a global economy, any faulty business practices affects investor confidence, which is crucial to developing new technologies and encouraging innovation.

In 2005, about 88% of households in Vietnam had access to electricity. This means about 2 million households or 413 communes remain without electricity access, creating a significant market opportunity (Nguyen, 2007). The power sector is dominated by the Electricity of Vietnam (EVN) utility, which is wholly owned by the government (Nguyen, 2007). The country's consumption growth rate between 1995 and 2005 was 14.9%, which is more than the GDP growth rate of 7.2% over the same period, and the electricity demand is expected to grow by 6.1% per year between 2005 and 2030 (Asian Development Bank, 2009). If demand growth continues, then Vietnam runs the risk of needing to import energy if no new energy resources are utilized (Nguyen, 2007).

Vietnam is rich in both fossil fuel and RE sources and is currently a net energy exporter (Das & Ahlgren, 2010). In the northern part of Vietnam, hydro and coal power are the main sources of energy. For the southern part, the main source is gas turbines. In 1994, a major infrastructure project was initiated to build a north-south transmission line to enable power exchange between regions, diversifying energy supply throughout the country. Currently, a significant portion of the Vietnamese population is also dependent on non-commercial biomass energy, such as wood, dung, and rice husks (Das & Ahlgren, 2010). Vietnam also has a good potential for wind energy, small hydroelectric projects, and solar energy (Asian Development Bank, 2009). There is about 31,000 km² of land area available for wind development, which could produce around 3,572 MW of electricity (Nguyen, 2007). Vietnam's potential for new large hydroelectric projects is low. The country has developed most of its hydropower potential, leaving room for investment growth only in smaller projects (Asian Development Bank, 2009).

To encourage energy self-reliance, the government developed a comprehensive domestic strategy to facilitate both domestic and international activity. The plan addresses three main challenges: energy infrastructure, energy import dependency, and energy-efficient growth. All of these challenges are highly capital intensive, but if tackled, will create a reliable foundation for future projects a better investor environment (Asian Development Bank, 2009). In 2008, the National Energy Strategy, implemented by the government, set out a number of specific targets for the period through 2020. Some of the goals included in the plan are the development of new power generation infrastructure aligned with demand and with a high level of reliability, the attainment of a specific RE generation market share, the improvement of rural access to and use of commercial fuels, and sector restructuring. The Vietnamese government wants to decrease its reliance on oil imports through encouraging the diversification of the overall fuel supply, as well

as improving energy efficiency and emerging conservation. Another government RE policy is the 2006 National Energy Efficiency Program. The Program emphasizes the importance of education and awareness about RE and the energy market in general throughout all business sectors. The Program also stresses improved management and introducing more efficient equipment and infrastructure while phasing out the old (Asian Development Bank, 2009).

Vietnam has recognized the importance of RE, but has not allowed a competitive market to form, which hinders innovation and efficient investment. The country has the advantage that the government can direct funds where it sees a priority, but the government is not capable of allocating resources in a completely effective manner. Recently, the Vietnamese government has opened up to more international investments that in all business sectors. This openness could lead to joint ventures and partnerships in the energy market. Because the energy market is dominated by EVN, the market is highly affected by politics and bureaucratic processes. This may discourage potential joint venture participants from working with an inefficient government entity.

Competition pushes companies to eradicate inefficiencies and create better, innovative technologies and processes. Without the pressure from competitors, process innovation becomes stagnant. So, if Vietnam were to open its energy market and not have the EVN utility dominate the energy market, more investors would be willing to take advantage of the growing opportunities in the country. The government would also need to create incentives for investors to collaborate with government entities to encourage capital exchange. Some incentives that could better the market environment are feed-in tariffs, tax credits, and lower capital borrowing rates.

By focusing on providing incentives to encourage local RE potential, a country can grow its energy market, as well as its investor appeal. Vietnam has proven great wind energy potential, and the market is essentially untapped, creating a significant opportunity for investment. An efficient method for capturing the wind energy and other RE resources in the rural country structure is to keep the electricity in a decentralized structure. Each area can maintain and use its energy locally, while decreasing costs for an extensive grid system. The capital required to produce energy in this system would decrease, allowing for better potential returns for investors, as well as decrease the cost for the government investment. Also, the infrastructure development requirements would decrease, permitting more of the population to have access to electricity, but the cost is still affordable to end users.

Summary

Population and industrial growth are continuously pushing energy demand upward, creating a market need for more reliable, sustainable energy resources. By evaluating the current conditions of the Philippines, Cambodia, and Vietnam governments, energy markets, and market barriers, appropriate solutions to bettering the investor environment can be developed. These countries exhibit a variety of infrastructure levels and government policies applicable to a range of countries. The solutions and strategies for these countries focus around implementing incentive legislation and infrastructure design using feed-in tariffs, tax deductions, and capital loan discounts, establishing business relationships on an international level, and considering decentralized energy systems. Every country is in a unique situation and has its individual needs, but commonalities in government structure, RE potential, economic situation, and market barriers allows solutions and strategies to be transferrable. These strategies will help build an

environment suitable for RE investment growth in Southeast Asia, as well decrease the region's carbon footprint.

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